ing epoch, especially as the intervening links are, in all probability, absent."

Mr. Blake selects certain species of Orthocerata which may have been produced by descent; at the least it is only supposition, and he states that there is no proof that they are actually so connected, but to the general theory of evolution—which merely states that every form of life has been developed from a preceding one nearly allied to it—the present study affords no contradiction or difficulty, but affords aid—which if not so great as could be desired, is yet as much as could be expected. In the present study of the Palæozoic Cephalopoda we have a fair representative of a successive fauna of the same class, and the species are grouped round a series of central types; and so long as the surrounding circumstances remain constant and the same, the process of evolution by indefinite variation and survival of the fittest should either be uniform, and leave relics having no special grouping, or it should cease when the best adaptation to the surrounding circumstances or conditions had been acquired. These views are expressed and carefully argued by Prof. Blake, in the concluding pages of his work. "The great defect," writes Mr. Blake, "of the theory of natural selection is that it leaves the original variation, which is the basis of the whole to chance; chance variations are not likely to lead to any law." "The part which it has effectually performed is to show how variations of the individual may produce permanent changes in the species, and thus break down the idea of the fixity and independence of the latter." "We are, perhaps," says the author, "as yet too dazzled by the brilliancy of the theory to perceive its inadequacy as a complete account of life or to place it as one link only in the chain of explanations."

The "General Observations" of Prof. Blake on pp. 237-44 are a fitting termination to the laborious part undertaken by him in describing the 145 Silurian species. The work has been most carefully and honestly done, and now for the first time we possess a complete monograph upon the Tetrabranchiate Cephalopoda of the oldest Palæozoic rocks; no less than 31 quarto plates illustrate the species, and all are drawn life-size. Mr. Blake has examined 2000 well-characterised specimens, and has visited all the museums and private collections in Britain likely to contain materials for his work, and as he remarks, the work includes a description of every known specimen so far as it presents any available characters.

The fragmentary state of nine-tenths of the specimens collected, demanded from the author the most careful examination, whether by comparison or through description of specimens, and those who know the condition of Silurian Cephalopoda as occurring in this country will indeed appreciate the critical labour of Prof. Blake; he has rendered great service to palæontology. The book was the one want, as a completion to the works of Murchison, McCoy, Salter, and Sowerby in Britain; a companion to the grand monographs by Barrande upon the Cephalopoda of the Silurian Rocks of Bohemia, also a fitting accompaniment to the monograph by De Koninck upon the same group for the Silurian and Carboniferous Rocks of Belgium. No library devoted to natural science should be without this first volume, and no student of Palæozoic species can do without it. No group of invertebrata are of such importance to the stratigraphical geologist as the Cephalopoda; in Britain alone the Palæozoic species number nearly 400, and in Bohemia the *Silurian Cephalopoda*, as described by Barrande, reach the great number of 1600, the Devonian species 500, and the Carboniferous species of Europe 350 species; these totals will at least give some idea of the life and distribution of this class of mollusca through time in Europe, and as Prof. Blake's first volume only treats of the Silurian of Britain, we wish him further success in his continued work upon the British Devonian and Carboniferous species, the fossil forms in which require the most minute, careful, and detailed study. R. E.

OUR BOOK SHELF

Social History of the Races of Mankind. Fifth Division: Aramæans. By A. Featherman. (London: Trübner, 1881.)

WE do not like to discourage a student who has evidently a zeal for knowledge, and must have given great labour to compiling the comprehensive account of human society, of which this volume is the first instalment published. But we are bound to say he does not seem alive to the differences of value among the travellers' books of which he gives a list at the end of each section, and out of which he has pieced together extracts describing Jews, Arabs, Egyptians, &c. Thus some statement about the Copts may be out of Lane's "Modern Egyptians," or it may be out of Miss Lot's "Nights in the Harem," and the reader would rather like to know which is which. Mr. Featherman writes in his preface: "The facts have been selected with critical discernment, and no doubtful or incredible statements are admitted in the text, unless controverted in a footnote." Then follows an introduction, which begins: "The primæval man did not spring from a single stock, or from one ancestral type. He arose under varying conditions, and at different geological periods. The initiatory forces of nature which caused his primitive development, existed in the same degree in all the isothermal regions of the earth, and whenever the favourable circumstances were capable of producing and fostering into maturity the human animal, there he appeared," &c., &c. Putting preface and introduction together, it is plain that the author's critical discernment does not enable him to know a doubtful statement when he sees it, even when it is of his own making. In fact he does not quite know where he is, or a casual look into his volume would not show the ancient Egyptians classed among the Aramæan or Semitic nations without mention of their great physical difference from Jews and Arabs, nor would there be found in the account of the Egyptian religion a mention of Isis as being Ceres and Proserpine, mother and daughter at once. The book deserves a place on the library shelf, and will be useful to students, especially for its descriptions of Druses, Talmud Jews, and other little-known minor groups. It is doubtful if its reception by the public will justify the series being continued; but in case it goes on, the materials ought to be more carefully selected, and references given.

Commercial Organic Analysis. By A. H. Allen. Vol. II. (London: Churchill, 1882.)

THE first volume of Mr. Allen's work treated of cyanogen compounds, alcohol derivatives, phenols and acids; in this second part the very useful and practical character of the work has been fully maintained in the description of the properties, tests and assay of the hydrocarbons, fixed oils, and fats, sugars, starch and its isomers, alkaloids and organic bases, &c. The author has omitted, as stated in his preface, all mention of dyes and colouring matters, coal-gas, and animal products, on the ground that their consideration would have inconveniently in-

creased the size of the work. This is somewhat to be regretted, as they are matters of quite as much importance as fixed oils, &c., to which a long chapter is devoted, and their inclusion would have certainly increased the value of the book for all general purposes.

The chapters on paraffins, terpines, and homologues of benzene are very clear, and in many cases detailed methods of assay, as, for instance, with benzene, anthracene, &c., are given that will be found of practical value.

A large chapter is devoted to the description of methods of examination of fatty oils and fats employed in the soap manufacture, and the same section also gives considerable general information respecting varieties of soap with methods in some cases improved by the author, for the analysis of soaps; in particular a tabular arrangement of analysis of a soap on p. 242.

About 100 pages are devoted to the important subject of sugars, and in this space we find an admirable condensation of methods in use, both optical and chemical, for the detection and determination of the various varieties of sugars met with commercially. The optical portion is prefaced by some short remarks on construction, and varieties of polometers in use, which might with advantage have been somewhat extended.

All the methods given in this section are up to date, and cannot fail to be of use not only to the practical man, but to the student.

The chapter on the alkaloids is also a very complete compilation of methods of detection, &c., that have been proposed and found to be reliable up to date. No doubt the book will be found valuable as a reliable compilation of methods, &c., as such, saving much time and trouble in referring to the original publications. The author is an eminently practical chemist, and in his preface to the first volume seems to deride the teaching of "ultimate organic analysis" and the "ringing the changes on the everlasting-chloro-bromo and nitro derivatives of bodies of the aromatic series."

The quality of Mr. Allen's production atones somewhat for this ebullition, for his book requires a considerable amount of theoretical knowledge to be possessed by the user; and it is very desirable, if we are to maintain a position as chemists at all, that the cant about "purely practical work" should cease, and a more thorough foundation in theoretical chemistry be imparted to students, so that they may become reliable practical men, and not mere machines for manipulating test-tubes.

Nordenskjöld's Arctic Voyage Round Asia and Europe. A Popular Account of the North-East Passage of the *Vega*, 1878-80. By Lieut. A. Hovgaard. Translated from the Danish by H. L. Brækstad. Maps and Illustrations. (London: Sampson Low and Co., 1882.)

LIEUT. HOVGAARD, of the Danish Navy, was one of the most efficient members of Baron Nordenskjöld's well-selected staff on board the *Vega*. When he returned from the remarkable voyage, he very naturally felt impelled to tell his countrymen how he had fared and what he had seen. This he has done in a pleasant and popular style, utilising to some extent the material collected by his chief. Lieut. Hovgaard, while dealing mainly with its lighter aspects, gives a fairly complete sketch of the voyage. The translation is well done, and the translator deserves special credit for the intellgible way in which he has rendered Russian names. The illustrations are not up to a very high mark.

The Sphygmograph; its History and Use as an Aid to Diagnosis in Ordinary Practice. By R. E. Dudgeon, M.D. 8vo., pp. 72. (London: Bailliére, Tyndall, and Cox).

THIS book may be of some service to beginners, as it gives rudimentary instruction in the use of the instrument, but this is all it does. The history is carelessly written, the account of the indications given by the sphygmogram is imperfect, and the deductions drawn are sometimes, we think, incorrect. From a curve in the upstroke the author concludes that the ventricular contraction is of a peristaltic character, a conclusion which would be most important if it were correct. But he does not at all take into consideration the great probability that this curve is due to instrumental error, inasmuch as it does not appear in the tracings obtained by Marey's sphygmograph, in which the connection of the writing-lever with the artery is more perfect than in Dr. Dudgeon's instrument. The chief value of the book consists in the description and directions for applying Dr. Dudgeon's sphygmograph, which certainly possesses the great advantage over other instruments, that it is much cheaper, and can be applied much more quickly, and with much less trouble.

A Great Mathematical Question. By T. Wakelin, B.A. (Melbourne: G. Robertson, 1881.)

A PAMPHLET of 16 pp., with a coloured diagram, the object of which is to show the fallacy of the *measure* of kinetic energy. It is an account of the old dispute originated by Leibnitz, and about seven pages are taken up with extracts from Whewell's "History of the Inductive Sciences" (vol. ii. pp. 68-70); *Penny Cyclopædia*, "Vis Viva"; *Encycl. Brit.*, "Energy"; Balfour Stewart, "Heat" (pp. 301-4); and Routh's "Rigid Dynamics" (pp. 260, 263, 270-1), with a reference to Todhunter's "Mechanics" (pp. 210, 211). We would suggest, as additional references, Clerk Maxwell, "Matter and Motion" (§ lxxvii.), and Tait's "Recent Advances in Physical Science." Mr. Wakelin concludes: "It will therefore be seen that the *distance* through which a body *falls* during the time of falling, is not a measure of the work of the force of gravity during that time. This, of course, means that the ordinary measure of the kinetic energy of a mass in motion is an erroneous one."

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

The Existence of a Voice in Lizards

THE letters on the existence of a voice in lizards, by M. Pascoe and S. P. Oliver, in NATURE, vol. xxv. pp. 32, 174, gave me much pleasure, being a confirmation of observations first made and published by myself in 1874, but doubted in different quarters. In my paper, "Zoologische Studien auf Capri, II. Lacerta muralis coerulea, ein Beitrag zur Darwinschen Lehre, Leipzig, Engelmann, 1874" (p. 20), I have laid down the result of my observations, in the first instance, concerning the habits of the bluish-black wall-lizard, *Lacerta muralis cærulea*, discovered by me on the Faraglione rock near Capri, and subsequently on those of other wall-lizards. There, I say: "To the harmlessness (or fearlessness, mentioned previously) of the blue inhabitant of rocks—*Lacerta muralis cærulea*—I owe the discovery of the animal's intonating capacity, a peculiarity generally ascribed among reptiles to the geckoes and chamæleons, but never observed in wall-lizards till now."

One summer-day I heard in the room where I kept a cage of lizards a peculiar sound, similar to the piping of a nestling, only softer. Having listened attentively, I was surprised to find it proceeding from the throat of one of my male blue lizards. Leisurely resting on a stone, the animal repeated the sound a dozen times, perhaps at intervals of about a quarter of a minute, each time opening its mouth a little way. For several consecutive weeks I noticed the same kind of voice in other individuals of both sexes, after which period I did not hear it for months. A series of these calls were taken down by me from ear; I give them here: "chri, bschi, riä, bi, bschiä."